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COMMUNICATIONS

EXPERIENCE GAINED FROM ONE HUNDRED AND FORTY TREPHINE OPERATIONS FOR GLAUCOMA*

BY

MALCOLM L. HEPBURN

LONDON

IT may be thought that the subject of operative treatment for glaucoma has been sufficiently thrashed out, and that very little more can be said about it. With this opinion I do not agree. Glaucoma is so serious a condition, especially the chronic type which shows so many variations in the symptoms and signs, that the question of operative interference merits all the discussion we can put into it from every point of view. Many contributions have recently appeared in favour of iris-inclusion and silk-inclusion operations rather to the detriment of the iris-free operations, with very little in defence of the latter method from those who are in the habit of frequently performing the trephine operation; while those on late infection have, to my personal knowledge, deterred many surgeons from advocating trephining with any degree of confidence, and have indeed led some to give it up altogether. In perforating wounds of the eye, and after cataract extractions, it is the aim of surgeons to avoid permanent inclusion of the iris in the wound owing to the danger which we have always been taught to believe by pathologists is associated with such inclusion; and I

*Read in the Section of Ophthalmology at the Royal Society of Medicine, January 13, 1922.

fail to follow the arguments by which it is sought to justify it in operations for glaucoma, even though some of them have turned out satisfactorily, unless, of course, all other methods have proved unsuccessful.

No doubt it *is* a dangerous practice to leave an opening in the eye only separated from the external air by a relatively thin layer of conjunctiva, but this applies to all filtering scars, however they are made, and the only question to decide is which is the least dangerous.

The difficulty of suddenly upholding a particular type of operation as opposed to another is that one is not at the moment prepared with all the necessary data on which an opinion, to be of any value, must always depend, and this fact stifles discussion. In a subject like glaucoma we cannot be too careful in collecting all the available evidence in order to enable us to decide on the best type of operation.

During the last nine years I have performed 140 trephine operations, of which 29 were private cases and the rest hospital ones; and although this represents nothing exceptional compared with those performed by many other surgeons, I presume that my colleagues at Moorfields have probably done a corresponding number, and if all their experience were added to mine, I feel sure there would be an overwhelming amount of evidence in favour of the trephine operation. At any rate, late infection is extremely rare at Moorfields, and I believe its occurrence is much exaggerated.

Very possibly I have nothing very new to say on this subject, but I have thought the experience I have gained might be useful to others, and anyhow, may prove a basis for discussion, as I am aware that my views do not entirely coincide with those of others.

I have not escaped any of the complications which appear to have happened to others. I have lost the disc and found it again in the anterior chamber when I suceeded in getting it out; I have lost it and never seen it again anywhere; I have done complete iridectomies by mistake and also on purpose; I have experienced delay in re-formation of the anterior chamber, and in one case it has never formed at all; and I have also lost vitreous on one or two occasions.

The technique I have learnt to adopt is as follows:—I have reasons for believing that to avoid late infection the importance of an efficient conjunctival flap cannot be over estimated; and I therefore endeavour to make it as thick as possible and take every precaution I can think of to prevent tearing or buttonholing the conjunctiva at every stage of the operation. To this end I strip the conjunctiva off the globe in its entire thickness right down to the sclera from the very beginning, and continue cutting with scissors, keeping the points directed towards the globe. I never

use toothed forceps for holding the flap for fear of tearing it, except for the initial fixation, and afterwards replace them with the finest pair of forceps without teeth, holding the flap horizontally and pulling it downwards over the cornea. As soon as, or almost before, the limbus is reached I use the secondary cataract knife and keep it directed towards the globe, pressing slightly all the time. In this way I strip up the superficial layers of the cornea, keeping well in the sulcus formed by the reflected flap, and aim at getting as far forward as possible. I never find that I get too far forwards, as my experience is that one is always further back at the end of the operation than one expects to be. In applying the trephine, I place it on the sclera and slide it downwards until it is in contact with the flap, but before commencing any rotatory movements I draw the flap upwards and backwards so that it is parallel to and along side of the trephine; this is to avoid buttonholing the conjunctiva. If such an accident happens at this stage without noticing it, the hole in the conjunctiva will not be seen until after trephining is completed, when the only thing to be done is to make a new conjunctival flap from one side or the other and draw it forwards over the cornea; otherwise the hole will certainly remain uncovered. While rotating the trephine I always direct the handle forwards so as to cut through the anterior part of the scleral disc before the posterior, thus ensuring the formation of a hinge posteriorly when the section is complete; in this way the removal of the disc can be accomplished later without any fear of injuring the conjunctival flap. Having once got the trephine to bite, I never remove it until the section is finished, so that the full force of the aqueous discharge will push the knuckle of iris well out of the wound. If the trephine is continually taken off, the sclera may be only partially cut through in several places, and the aqueous drains away slowly, not suddenly; in which case the iris may not prolapse at all or only very slightly, making it difficult or even impossible to remove any iris at all. The guide to the penetration of the sclera is the pupil coming up towards the hole. As soon as the iris presents it must be dealt with at once, and the disc may be left to take care of itself, attached as it is to a hinge posteriorly; any manipulation with the disc only leads to discharge of the aqueous and the iris slips back. I grasp the iris with very fine straight forceps, containing one tooth only, at the posterior part, at the same time pulling downwards and forwards in order to detach it from its root; this, I think, can be done better with straight forceps than with ordinary iris forceps, because owing to the curved shape of the latter the disc may be caught up at the same time as the iris, and the iris cannot then be pulled out quite far enough owing to the attachment of the disc, which limits the distance one is able to pull. I

believe Colonel Elliot advocates this method with his special forceps made for the purpose, but it seems to me that, in order to sever the two together, ordinary scissors must be used which may not make such a clean cut in the iris, and strands are left which may be difficult to replace and almost as difficult to remove. Lastly, I cut off the disc which can now be easily done without endangering the conjunctiva. Any layers of sclera left from an incomplete trephine section can be removed by pulling them up with a sharp hook and cutting them off with scissors; but I think this is unlikely to happen if the trephine is used in the way I have stated above. I generally put one or two stitches in the conjunctival flap, and I am beginning to think for some reasons it might be wise to put in more.

COMPLICATIONS.

Buttonholing the flap.—The flap must always be closely watched, and if any hole is seen, a new place must be selected for applying the trephine. I seldom use a repositor to see how far forwards I have stripped up the corneal layers in case the patient should roll his eye up, when the repositor may perforate the conjunctiva.

Loss of the disc.—This has happened to me three or four times. It may be drawn into the anterior chamber, it may be left in the trephine, or it may be washed away when the aqueous is discharged. Once I got it out of the anterior chamber with a repositor, but in the other case I never saw it again, and I do not think it matters much where it is so far as the prognosis is concerned.

Complete Iridectomy.—Sometimes the iris is so dilated at the time of the operation that the force of the aqueous discharge causes a total prolapse up to the pupillary border. Under these circumstances the whole of the prolapsed portion must be cut off and a complete iridectomy performed. I am sure it is unwise to do a buttonhole iridectomy and then try to replace the remainder of the iris through the trephine hole with a repositor; it only gets torn and tags may be left and become adherent to the hole.

Sometimes a complete iridectomy occurs through too free a division; it is only necessary to grasp the iris with a pair of single toothed forceps as high up as possible, and the scissors placed immediately below the end of the forceps. If a complete iridectomy is intentionally made, the iris must be pulled well out of the wound as in doing an ordinary glaucoma iridectomy.

I never like finding out that I have done a complete iridectomy by mistake, which has happened to me three or four times, because I think in this case the root of the iris has probably been left behind,

which, by adhering to the posterior part of the trephine hole, encourages at any rate partial healing; and my impression derived from the few cases where this has happened to me tends to support this view.

Vitreous Loss.—Apart from cases of buphthalmos, where this accident is not uncommon, vitreous loss has occurred in my cases about three or four times. It may not influence the ultimate draining capacities of the trephine hole, though I always expect it to do so; but no doubt it largely depends upon whether the vitreous is solid or liquid. In two cases of my own there was good drainage and the vision afterwards was not affected. In one case the vision was 6/6 and has remained so ever since.

Delay in re-formation of the anterior chamber.—This has occurred in about half a dozen of my cases, and I used to regard it as a reason for keeping patients longer in bed than usual, but I have modified my views in this respect and allow them to get up at the ordinary time, when I have frequently found that the anterior chamber forms immediately. It has been stated that the cause of the delay is that aqueous drains away beneath the conjunctival flap. I think this is quite possible and is a reason for more careful stitching of the conjunctiva, but this cannot account for all cases, otherwise the anterior chamber would not be likely to re-form so quickly after getting up. At the same time, I am apprehensive, when the formation of the anterior chamber is delayed too long, lest there be adhesion of the iris to the trephine hole, especially as there is nearly always a little inflammatory reaction in the iris after the operation; and for this reason I always use atropin as a routine treatment.

Lens comes forwards and sometimes becomes opaque.—This has occurred at the most in two or three of my cases, but in only one case could I be sure that there were no opacities before. I have thought that if lens opacities existed before the operation they might progress more rapidly afterwards.

I cannot quite explain these cases, but I think it is quite impossible to trephine on to and open the capsule of the lens, as has been suggested by some surgeons.

Detachment of the Choroid.—This has not, to my knowledge, happened very often in my cases, though I have looked for it; at the same time I think it may occur without being always recognized. I have not come across any serious complications arising from this accident though it may be responsible for failure in the re-formation of the anterior chamber, and I am inclined to think that it seldom makes much difference as the choroid generally becomes replaced.

Late Infection.—With regard to late infection, the first point to decide is what are we to describe as cases of this nature. Since

the presence of a permanent opening in the eyeball constitutes the weak point in the operation, entrance of organisms must be looked for through this channel to justify the term "late infection," and it seems to me that any inflammatory reaction must be associated with weakness or rupture of the conjunctival flap.

Inflammations which occur within the first few weeks of the operation one may reasonably ascribe to direct infection through the scleral and conjunctival wound, but those taking place many years afterwards in the presence of a thick firmly attached flap with good drainage I certainly do not place under the heading of late infection. I see no reason for assuming that every type of inflammation occurring in an eye after a trephine operation should be regarded as the direct result of the operation.

Results.—On looking through my records, nothing impresses me so much as the fact that cases I was able to secure early gave by far the best results, especially when I was able to perform the operation at a time when the tension was normal, and I only trephine in acute glaucoma if I have been successful in reducing the tension before the operation; otherwise I now do an iridectomy.

When I have once satisfied myself of the existence of glaucoma by catching a patient in a subacute attack, in spite of the fact that on recovery the vision is 6/6 and the field is full; or by the presence of the ordinary signs and symptoms associated with glaucoma, I always advise an operation, and I have had some of my greatest successes in cases of this kind. I have seen two eyes side by side in the same patient where one has been trephined in an early stage, but where the operation for some reason had to be postponed in the other, and the unoperated on eye steadily went downhill with the same symptoms; but after operation the symptoms were cut short and controlled, as happened in the first case. My private cases have been relatively far more successful than the hospital ones, and this I attribute to the fact that we are more likely to secure the patients in the initial stages because they are more observant of early symptoms, besides those cases which are discovered accidentally in the routine examination for refractive errors.

So far as I have been able to follow my cases, my greatest failures, of which I have had about 13 altogether, have been in those where the tension was raised at the time of the operation, when the history has been of long, often several years, duration, and when the field has been *generally* contracted almost down to the fixation point; also in secondary glaucoma, in buphthalmos, or in any cases complicated by previous accident or changes in the fundus. I reckon as failures those cases where the vision had fallen to finger counting or hand movements with much contraction of the visual field, and where no improvement followed the operation

even though the little vision they had was preserved; or where the subjective symptoms have continued either with or without draining of the trephine hole. Also I have included the cases where vision has become in any way worse after the operation; such as fairly good distant vision (e.g., 6/18 or 6/24), but where there has been difficulty in reading.

I do not count those cases which, although not definitely improved, still retain a useful standard of vision (say 6/18 or 6/24) both before and after the operation.

Many cases, so far as vision is concerned, appear worse immediately after the operation but show improvement later on, and I have had some striking examples of this kind, but some, especially the bad ones, never return for examination.

I have seldom had good results in cases of acute glaucoma or secondary glaucoma; there is too much congestion round the limbus in both instances and this encourages healing of the trephine hole; and, moreover, in acute glaucoma, the conjunctiva is often so friable that there is danger of the flap giving way both during the operation and afterwards.

I have had one case of suppuration six months after the operation, and this was due to a weak conjunctival flap which I noticed at the time, and I was therefore forced to draw over a new piece of conjunctiva which, however, evidently did not give sufficient protection. Another of my cases was staying at Bournemouth four years after I operated on her, and came under the care of Mr. Maddox, from whom I gathered that the eye was nearly lost from suppuration accompanied by acute conjunctivitis, but she completely recovered under his treatment. On her return it seemed to me that it might have been a case of iridocyclitis rather than suppuration, as I noticed several spots of " k.p." and some vitreous opacities; but at the same time the conjunctiva immediately covering the trephine hole was excessively thin.

Two cases of cyclitis have occurred, one in private four years after the original operation, and one in hospital, both of whom recovered. I have never had a case of sympathetic following trephining. I always advise regular massage to the eyeball once or twice a day, unless the tension is on the soft side, or the conjunctival covering appears thin; and the slightest suspicion of rise of tension, mists, and haloes, can be completely controlled in this way.

I have, therefore, no hesitation in saying that, from my own experience, I have formed the opinion that the operation of trephining, performed with every consideration for the conjunctival flap, is the ideal one for chronic glaucoma, especially for that type occasionally met with in young adults, and the earlier the operation is undertaken the better.

SOME REMARKS ON THE NATURE AND TREATMENT OF STRABISMUS

BY

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EX-ASSISTANT IN OPHTHALMOLOGY IN THE PARIS HOSPITALS

THE works of Donders, Javal, and Parinaud have profoundly modified our conception of strabismus. They have, in their turn, reviewed the therapeutics of this affection.

One of the first disciples of Dr. Rémy, the author of the Diploscope, has pleasure in putting forward, in this paper, for the benefit of its numerous readers, a few new views concerning binocular vision, strabismus and its treatment.

Rémy's diploscope has become indispensable to the oculist. It is the real instrument of control in the measurements of the frequent alterations of binocular vision. Most simple in construction and consisting of a long rod, 1.20 m. in length, carrying in its centre a plate, perforated with two apertures, and at its end a cardboard, marked with letters or coloured.

The slightest alterations in binocular vision are immediately recognised by the displacements of the letters, which no longer appear in their normal place, but as in crossed diplopia if there be divergent strabismus, or as in homonymous diplopia if there be convergent strabismus.

To facilitate the understanding of the working of the instrument, let us experiment with four letters. The cases coming before our notice being the following:—

(1.) Binocular vision being normal the results will be:—

K O L A

(2.) Neutralization of one eye, and, depending upon the eye involved:—

O A or K L

(3.) Should there be divergence the patient will read:—

K OL A

(or) If the degree be accentuated:—

K O A

K L O

K LO A

K L O A

KL OA etc.

(4.) Should there be convergence the reading will be:—

KO LA
K A
OK AL
OKAL
O K L
O A K L etc.

(5.) Lastly, should there be sursum or deorsumvergence the letters will place themselves on different lines:—

K L
O A

with or without horizontal strabismus trouble.

The definition of " strabismus " as given by Parinaud is very explicit. It is a question of " a flaw in the development of the binocular sight apparatus, preventing the convergence of the eyes upon a fixed object." It is a central discipline disorder. This conception explains certain cases of " strabismus " where the optical causes are non-apparent, bringing out the importance of personal morbid accidents (infectious diseases), or hereditary defect (syphilis, alcoholism, consanguinity).

Most children suffering from " strabismus " are neurotic subjects, and " strabismus " develops on different lines in each special case.

However, no theory is absolutely correct, and, however true that of Parinaud may seem, in so far as it concerns strabismus in children, it does not seem to apply to the habitual strabismus in the adult.

Our intention is to show precisely that this affection can supervene among individuals whose binocular sight is perfectly developed, and without necessarily being connected with special nervous influences. Here the visual alteration alone is at fault.

How does " strabismus " evolve?

Strabismus must not be confounded with an apparent deviation or squint, which may not really exist (invisible strabismus), or again, with paralysis. The first degree of " strabismus " is simultaneous sight. The two eyes see at the same time notwithstanding a slight inco-ordination, whence may come visual uneasiness.

This period is soon succeeded by partial simultaneous sight (simultaneous sight of Parinaud), which we have elsewhere called *panoramic vision*. Parinaud has defined it very well in further naming it " *alternating central vision.*" Neutralization is the most typical and curious characteristic of this period.

In panoramic sight, neutralization is the reaction of the defence against diplopia, and the more rapidly it intervenes the less the patient suffers from the inconvenience of the preceding period.

This neutralization is elective and keeps exclusively to that portion of the retina corresponding to the object seen by the non-deviating eye and avoiding the other regions of the visual field.

Neutralization does not always follow the same lines. It is alternating and generally remains so when both eyes are of equal strength or when one is hypermetropic and the other myopic.

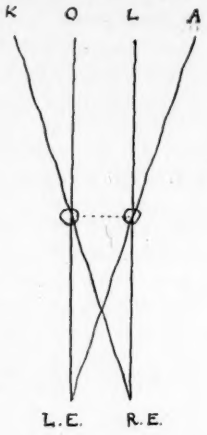

FIG. 1.
Illustration of the four-letter experiment for normal eyes
K L is seen by the right eye.
O A by the left.

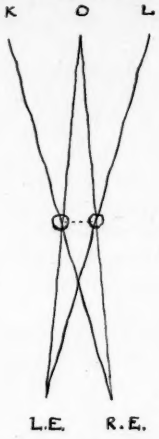

FIG. 2.
Scheme of the three-letter experiment for normal eyes.
K O is seen by the right eye.
O L is seen by the left.*

But at times, with or without appreciable cause, where one of the eyes is manifestly inferior to the other, neutralization becomes fixed, and alternatively the sight becomes *monocular*. This new stage is the most serious on account of the momentous disorders it brings about. One of the most embarrassing of these accidents is amblyopia *ex* anopsia.

Simultaneous sight, alternating, central, or panoramic and monocular are the stepping stones, the successive and characteristic stages of strabismus. In the course of this affection amblyopia and deviation itself are but frequent, simple and, often, very annoying disorders.

Strabismus in the adult.—An appreciable difference in the sight of the eyes is the usual cause of strabismus in the adult. Hering compares the optical apparatus to a double team driven by single

*Ch. Delogé.—"On Corrections of Anisometropia," *Arch. d'Ophtalmologie*, 1904.

reins. We will use his ingenious idea. If one of the team goes lame, it either stumbles on, or stops, and must be detached. It is the same case with the sight. The causes of strabismus in the adult are, then, very varied. I have recounted thirty cases of anisometropia, chosen from many others, in my inaugural treatise*: each time the difference of refraction exceeded two dioptres, a visual alteration, an actual strabismus existed before correction.

The onset of strabismus in the adult, as in the child, is slow and progressive, and of insidious growth.

Particular characteristics.—Deviation, apparent or not, is nearly always produced from outside, and divergent strabismus is much more frequent. Amblyopia *ex* anopsia is less pronounced. Strabismus is more frequently seen among perfectly balanced and healthy individuals with whom the affection is ocular, and purely accidental. Such form of strabismus is very easy to cure.

Treatment.—We shall say nothing on the operative treatment. It is the only treatment to be resorted to in two circumstances:—When the visual acuteness of one of the eyes is definitely bad or far inferior to the other, or when it is impossible to secure the necessary attendance of the subject.

In all other circumstances we think that the orthoptic treatment is preferable, not only because it is the most reasonable, but because it is the only one to give complete results.

Convergent strabismus.—Convergent strabismus is particularly frequent in children, but its origin is not always recognized as the same. It is very often allied with a nervous central disorder (Parinaud); at times the influence of refraction is shown (Donders); and in other cases these two causes mingle so closely that it is impossible to say which part is due to the nervous system and for which abnormal refraction is responsible.

In the first instance a most careful and minute examination is necessary as well as optical correction. By these means many cases of strabismus improve spontaneously. If there is amblyopia we must not be satisfied with an improved squint, but make the amblyopic eye work most actively so as to gain time. Just as soon as the visual acuteness reaches two or three tenths, commence exercises to re-establish binocular sight.

Each one, in their turn, the stereoscope and the amblyoscope have been well spoken of. These instruments certainly possess certain qualities as well as certain faults which interfere with perfect re-education. It is the diploscope, large size or small, to which we must turn.

The first thing to be obtained is simultaneous sight, diplopia. This is generally very rapidly obtained by a little ingeniousness. Neutralization often gives way in showing the letters in a vertical

*"Anisometropia and Binocular Sight." Paris, 1907.

position or in replacing those that are not seen by colours, brilliant objects, etc.

The great, or shall we say, the greatest obstacle or difficulty is to obtain divergent movement. The difficulty is reduced by the use of prisms of weaker and weaker strengths.

If the child is willing and keen, and the parents are patient, it will be noticed that the amblyopia will improve and a cure will follow. Even where these means fail to effect a cure, the exercises prepare the ground in a wonderful manner for surgical intervention. Nevertheless, the most perfect operation must always be completed by diploscopic exercise as well as by perfect optical correction in order to maintain results.

Divergent strabismus.—Most oculists appear to think that this variety of strabismus, however accentuated the case may be, requires surgical intervention. Outside the case of amblyopia nearly incurable in one eye, the contrary seems nearer the truth.

Let us say at once that one often meets with an appreciable difference of sight at the outset, resulting from lesion (leucoma or monocular cataract), or again through anisometropia caused by myopia or by unilateral astigmatism.

The hundreds of cases that have come before our notice permit us to affirm that when the degree of anisometropia has surpassed two dioptres there is generally suppression of normal binocular sight, and, in many cases, apparent divergent strabismus. A marked anisometropia is, in itself alone, sufficient reason; of this I am certain from personal experience. I have 5 D of myopia in both eyes, and after 15 or 20 days of monocular correction the annoyance caused during the first few days disappeared, but monocular sight and an apparent divergence had been established in the uncorrected eye.

Generally, oculists have quickly given up the correction, which far from improving the sight, became a source of inconveniences, such as vertigo, nervous headache, false relief and dizziness. Taught by these facts, practitioners have wisely dissuaded the correction of anisometropia superior to one dioptre and a half.

In our turn we have resumed this study, aided by Rémy's diploscope, and found reasons to oppose a full correction. These reasons are two in number:—*Strabismic deviation*—the cause of more or less obvious diplopia which is often sufficient to awaken improved visual acuteness, and the *unequal size* of objects seen by each eye. Many years of experience convince us that the inequality in the size of objects, which is such a trouble to the patient in the beginning, never persists. It is not so with deviation, this requires a more or less lengthy treatment, and only yields to a course of suitable exercises.

The real difficulty arises from the insufficient degree of conver-

gence; that it is which causes all delays in cure, therefore our first effort ought to be that of diminishing and vanquishing it. Convergence once established, victory is at hand, for the re-education of binocular sight becomes henceforward, rapid and easy.

We will rapidly sum up our usual course of treatment in the greater number of cases of divergent strabismus.

In the first place, full correction of the ametropia, no matter what the degree or how marked the difference in refraction between the two eyes; I have even corrected and cured two patients suffering from unilateral aphakia, details of which have been published in my thesis. If this correction is not sufficient to remove neutralization, and this happens frequently where the deviation is very pronounced, I try to revive diplopia. Many excellent means may be utilised to this end, either simultaneously or separately. Diploscopic exercises, coloured glasses and different degrees of light will often suffice. In rebellious cases, prisms must be resorted to. I have used seventy dioptres of prisms in the case of one of my patients (Dr. G.).

In a very few rare cases, when the front sight was good, perimeter exercises were necessary to complete the cure of lateral sight. If the convergence is good and the subject willing the result is more rapidly obtained than by an operation.

A few years ago I cured a young man in twelve sittings (Mr. G. de S. J.) suffering from considerable divergent strabismus due to unilateral myopia of six dioptres.

I will briefly mention the following case of Mlle. E—— M——, aged 17.

I saw this patient on August 2, 1904, at the Hotel-Dieu. She presented a paracentral leucoma of the right eye and myopic astigmatism.

Skiascopy:—R.E. (vertical axis - 2 D., horizontal axis - 6 D.), L.E. (emmetropic).

Ophthalmometer:—R.E.=5 D. As. L.E.=Normal.

The sight of the right eye after correction equalled 0.5 only. This girl squinted very markedly outwards and a little above, but this deviation was not visible at first with the large diploscope, and it took half an hour of rather trying exercises to make the neutralization, which was alternating, disappear. Her sight soon became simultaneous, and the diploscope revealed a divergent and sursumvergent strabismus, of the existence of which I already felt sure. The next day her sight was still simultaneous, and the letters seen by the right eye, armed with its correction, appeared much smaller. I diminished the strength of the spherical glass by 1.5 D., and immediately the letters became equal. Two days later I returned to my first correction:—R.E. (horizontal axis - 5 D. sph. - 6 D. cyl.) and the letters remained the same size. The sight of

the right eye is now 0.9. The binocular sight is normal. In this case, exercises for six days sufficed to cure a marked ametropia, complicated by astigmatism, and a double deviation, one of which was quite considerable. Seen two months later, the sight of Miss M—— remained perfect.

Conclusion

Owing to its double nervous and optical origin, convergent strabismus requires a treatment that is lengthy and particularly difficult to establish, but in which re-education of binocular vision is essential. Where possible this constitutes the preferable method, as well as the indispensable complement to surgical intervention. We ought to beware of the opinion of a great number of excellent oculists who believe divergent strabismus can only be relieved by surgery. With some reservations we hold the contrary to be the truth, and it is chiefly in this case that orthoptic treatment gives the most rapid results and brilliant successes.

GLIOMA RETINAE (WITH REPORT OF A CASE)

BY

DR. M. J. KEYS

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TRUE glioma retinae is seen so rarely and the subject is so interesting that it warrants publication of the details of every case observed.

The following case recently occurred in my own practice:—

Case History.—J. D., female, was born in the Jubilee Hospital, Victoria, two and a half years ago. She is the only child in the family. Mother pregnant but once. Parents: father, English; his mother was Scotch. The mother of the child is English, born in Lancashire; no history of any similar eye trouble on either side of the house. The little patient when born was a healthy baby, labour was normal, and she has never had a day's illness in her life, not even the diseases common to childhood, and when first seen by me, September 28, 1920, was a well-nourished, healthy child.

History of present illness.—About two weeks previously, a lady, one of the neighbours, drew the attention of the mother to the peculiar appearance of the child's right eye, and about the same time the child's cousin, a lad of 12 years of age, noticed the same thing, and curiously enough, remarked that it looked like a " cat's

eye in the dark." The parents then began to study the eye and noticed in looking at this eye from the temporal side that it had a peculiar white appearance in its interior. On September 28 the child was brought to my office for examination, with the history as given above.

Examination.—Tension of the right eye increased, lids and conjunctiva normal, cornea clear, no signs of posterior synechiae or cyclitis or " k.p.," the pupil slightly dilated and fixed. In looking at the eye from the temporal side the white appearance of the interior was quite apparent. The pupil was further dilated with homatropin and cocain and the ophthalmoscopic examination revealed the media clear, but a tumour mass could be seen springing from the lower nasal side of the fundus and projecting forward. No blood vessels were apparent on the growth, which presented an appearance very like absorbent cotton. The temporal side of the retina had the usual red reflex, but towards the growth this diminished, and approaching the growth the reflex was lost. No effort was made to test the vision in this eye. Vision in the left eye was normal and has remained so.

Diagnosis.—I concluded from the history and examination, particularly the absence of any trauma, of disease or sickness of any kind, that I had to deal with a glioma, keeping in mind the possibility of a pseudo-glioma. I explained the seriousness of the condition to the mother and advised immediate enucleation. Dr. Scott-Moncrieff, of the City of Victoria, saw the case and agreed with the diagnosis and concurred in the treatment. The parents consented at once to the removal of the eye.

Operation.—On September 30 the eye was removed in the usual way, with this exception : after the muscles were severed the optic nerve was grasped with curved artery forceps and cut between the forceps and the eyeball. The nerve was then put on the stretch and cut behind the artery forceps. This portion of the nerve, with the eye, was sent to the pathologist for examination. The eye was noticeably enlarged, as it was difficult to get it through the palpebral fissure after its separation. The wound in the conjunctiva healed without incident.

Pathologist's report.—" The retina is completely detached in this specimen and almost completely involved. Only a very small portion can be recognized as retina. The optic disc is involved. While the sclera does not appear to be involved in this particular section there is extra-ocular extension of the growth into the loose tissue about the ball.

Diagnosis.—Glioma exophytum.

(Signed)—J. H. MOORE."

Subsequent history.—After receiving the Pathologist's report to the effect that the growth was gliomatous, I advised the parents

to have the orbit exenterated, but they refused, saying that they would rather lose the child than have this deformity, so at the end of two weeks an artificial eye was inserted, and as the parents lived twelve miles from town the child was seen only occasionally. Two months after enucleation the mother brought the child again to the office, stating that they had noticed that the artificial eye was being displaced inwards. Examination revealed a tumour mass, soft in consistency, about the size of a small marble, under the conjunctiva, situated slightly to the temporal side. I explained to the parents that the growth had recurred and advised as a last resort the exenteration of the orbit and the use of radium. But they again refused as I could not promise them a complete cure, but they had heard of cures in other cases of malignancy, so two weeks afterwards they decided to have the second operation done. On December 17 the orbit was exenterated and the Pathologist's report was to the effect that the growth was gliomatous. On December 23, January 3, 7, 14, 21, and February 12, 20 milligrams of radium were placed between the lids and left there in each instance about five hours, but the growth again showed symptoms of recurrence and the use of radium was abandoned. The growth gradually increased in size. The child was seen from time to time and the growth kept gradually increasing. The child has slowly lost in weight, has lost her appetite and is irritable, sleeps badly, mostly under the influence of paregoric, but her mental condition has remained good. On June 11 photographs were taken, and it was noticed that there was a large tumour mass originating in the eye socket and protruding forward, looking very much like a truncated horn. The surfaces are fungating and bleed very readily, and the whole mass emits a sickening, musty odour. The nose is forced to the left and is almost covered by the tumour mass. The right nares is closed so that the secretions find their way backwards into the naso-pharynx and thence into the throat. The photograph also shows a large smooth tumour mass situated on the right lower jaw, at first bluish in colour due to venous stasis. The surface is also smooth and glistening. This tumour extends to the right clavicle, below and well beyond the middle line in front. Behind it extends beyond the middle line and as high as the occiput. Above it extends almost to the top of the ear. The lower pendulous portion is soft and fluctuating, evidently containing pus. Superimposed upon this mass is another smaller fluctuating tumour about the size of a hen's egg, located at the site of the pre-auricular gland. There is another tumour mass about the size of a walnut at the postparietal area in the mid-line. On the left side the sub-maxillary glands are enlarged and the whole chain of cervical glands are palpable as far down as the clavicle. No glandular enlargement below the clavicle on either side.

In the sulcus between the fungating mass and the tumour mass of the jaw pus is exuding posteriorly.

July 6 : The horn-like mass above described has enlarged in size to such an extent that the child's nose is buried under the growth and extends beyond the middle line, obscuring the vision of the left eye. That portion of the superior maxilla on right side containing the teeth is forced to the left about a quarter to a half-inch. The mouth is distorted so that the taking of medicine and nourishment is difficult. The large tumour mass of the right jaw has also enlarged in size, has also increased in venous stasis, and the growth projects beyond the clavicle. The child is now confined to its crib and refuses nourishment. Death will probably take place shortly, no doubt from exhaustion.

The subject of glioma retinae is interesting, not only on account of the nature of the tumour concerning which there is always some difference of opinion, but also on account of its comparative rarity. According to statistics the tumour is only observed once in 10,000 cases ordinarily presented in ophthalmological practice, so that the average ophthalmologist may not have the opportunity of observing a tumour of this kind in his ordinary practice.

I am deeply indebted to Dr. Paul D. Berrisford, of St. Paul, Minn., for his interest in this case, and for valuable notes drawn from his article, " Statistical Notes on Glioma Retinae,"[1] in which he brings the cases of glioma in the Moorfields Hospital, London, practically up-to-date, and he writes me recently that there has been practically nothing new on glioma since 1916. The cases in Moorfields Hospital were written from 1871 to 1905 by Lawford and Collins,[2] Marshal,[3] and Owen,[4] and Dr. Berrisford has brought them up-to-date.

Definition.—The first accurate and scientific description of the tumour was written by Wardrop[5] in 1809, based on the study of 17 cases. In 1853 Virchow[6] published the result of his exhaustive clinical and pathological research.

Both Wardrop and Virchow observed the similarity between glioma and the white substance of the brain. The term glioma retinae due to Virchow does not seem to be strictly correct. O'Connor[7] remarks that a glance at the literature of gliomatous growths will show manifold variations in those cases in which the retina was entirely obliterated in the tumour mass, and others in which the layer of rods and cones was demonstrated to be clearly free from participation in the pathological process. The point is fully discussed by Flexner[8].

Flexner and Wintersteiner[9] contend that the correct nomenclature is neuroepithelioma, as the tumours have their origin in the neuroepithelial layer of the retina, but the old term is retained on account of its general use, at the same time being more

comprehensive. It is also called sarcoma of the retina and fungus haematodes oculi, a term used by the older authors. Beer[10] called it amaurotic cat's eye. The tumours are subdivided by Hirschberg[11] [12], according to their location and direction of growth into exophytum and endophytum. In glioma exophytum the growth proceeds towards the choroid after the retina has been detached. It finally reaches the choroid and spreads out superficially and may go as far as the anterior chamber, or vessels may grow out from the tumour into the choroid accompanied by tumour cells. In glioma endophytum the growth is attached but loosely to the retina and grows forward into the vitreous, and as a rule the growth completely fills the eye. This form of growth is the more rare.

Histology.—All are agreed that this neoplasm originates in the granular layers of the retina and most commonly in the inner granular layer. The tumour is composed of small cells in a very soft basement substance. The cells consist of a definite nucleus surrounded by scanty protoplasm, which in many cases possess processes. The cells follow the blood vessels and on account of their rapid growth may take the appearance of tubular glands. Some are glia cells and others are ganglion cells. Degeneration in the intercellular substance takes place early.

Cause.—The cause of glioma is unknown.

Age.—The disease is one of infancy and childhood, no true cases having been known after the age of sixteen, according to the Moorfields Hospital report covering 135 cases from birth to seven years of age. The highest percentage was found to occur during the second year of life, gradually increasing from infancy to that age, then receding till there were only two cases in the 135 at the age of seven years; 56 cases or 41 per cent. were first noted before the thirteenth month; 26 cases during the second year—only two cases being reported in the seventh year.

Frequency.—Quoting again from Berrisford's report at Moorfields Hospital. Between the years 1871 and 1913, covering 42 years, the total number of outpatients numbered 1,259,452. Out of this number there occurred 131 cases of glioma retinae, or roughly, 1 in 9,600 cases, or .01 per cent. Other authors have about the same percentages.

Sex.—Males and females are affected about equally, with the balance slightly in favour of males. In 792 cases collected from many different sources there were 398 males, 361 female, and 33 cases in which the sex was not stated.

Eye affected.—In 25 per cent. of cases both eyes are affected, the disease originating in the second eye independently of the first, and not passing by continuity through the chiasma.

Metastases.—Wintersteiner, in his work, gives an interesting

report as to the relative frequency with which the various parts of the body become involved in the metastatic process. I quote :—

Brain and membranes—43 times,
Skull and bones of the face—40 times,
Lymphatic glands—36 times,
Parotid gland—9 times,
Skeleton bones—9 times,
Liver—7 times,
Spinal cord and membranes—5 times,
Kidneys—2,
Ovaries—2,
Lungs—1,
Spleen—1.

It is interesting to note in the case reported that the bones of the face were affected, also lymphatics and parotid gland, but the brain was apparently not involved.

Congenital aspects and family history.—Professor Fuchs says that a congenital morbid disposition; or, as he aptly puts it, " a congenital vice of development," very often lies at the bottom of glioma, and he says that often it is observed at such an early age that the beginning must be dated back to foetal life. This prenatal origin calls to mind a statement of Treacher Collins : " That a microscopical specimen of a foetal retina at three months with layers undifferentiated, is such that if shown to a pathologist it would be pronounced by him as glioma."

That the disease runs in families is beyond doubt. Many striking cases are on record. The following reported by Berrisford will suffice :—

The Grover family is very interesting. Thomas Grover was operated on in 1859 when five months old, the left eye being removed for glioma. He survived and had a family of two children. The son Frank had his eye removed at three years and died at the age of fifteen from paralysis. The daughter Beatrice Wallbank's first three children all died at four years with glioma, two of them having bilateral glioma. The next four children were all healthy, but the eighth—the last child, died at three years from double glioma. Professor Fuchs records a case in his text book in which a child of four years died of brain symptoms following removal of a gliomatous eye. Later on the brother, aged two, was found to have the same trouble in an eye blind from birth, and died from double glioma. A third child was suspected of having glioma, but the trouble proved to be coloboma of iris and choroid. Newton reports a case where ten out of sixteen in the same family died with glioma.

Glioma in a shrunken eye.—The presence of glioma in a shrunken eye is a rare condition, only about twenty cases are

recorded in all literature. Dr. Denis O'Connor, of Worcester, Mass.[7] records a very interesting case in an infant in which the shrunken right eye was removed and was found to be gliomatous. The child died later on from glioma of the left eye without recurrence in the right. His conclusions are to the effect that after destruction of the retina the necrosis progressed, the necrotic masses being replaced by connective tissue, which in turn is invaded, and the cycle is repeated until finally the eye became quiescent, having undergone necrosis and calcification, through, as he thinks, insufficient blood supply; but he further states that some of these cases finally die of recurrences, and he records many of these cases as pseudo-gliomata, or as an episode in the course of true glioma preparatory to further advance. This probably explains the cure by ophthalmologists of one hundred years ago, who resorted at that time only to antiphlogostic, alternative, and derivative treatment.

Differential diagnosis.—In making differential diagnosis the history of the case, as well as the family history, is important. One must enquire for history of injuries to the eye, and ascertain if the child has had meningitis or other infectious diseases common to childhood, and the signs of iridocyclitis and keratitis punctata must be looked for. The rare diseases, such as :—

Acute suppurative hyalitis,
Cysticercus in the vitreous,
Retinitis circinata,
Detachment of the retina with dropsical degeneration of the visual cells.

as reported by de Schweinitz, must be kept in mind as a possibility. Simple detachment of the retina and leukosarcoma are both rare conditions in childhood. A corneal cicatrization or staphyloma may obstruct the pupillary space; or, in the glaucomatous stage of glioma, a hyphaema or cataract may obscure or prevent ophthalmoscopic examination, or haemorrhage into the vitreous may become organized and render the diagnosis difficult. Persistent vascularity of the lens capsule or hyaloid artery with posterior polar cataract may also lead to a wrong diagnosis. Tubercle of the choroid and chronic inflammatory processes in the choroid and ciliary body are the two conditions that call for careful discrimination, and often a positive diagnosis cannot be made until after the eye is removed. A report from Moorfields Hospital from 1888 to 1893 indicated that seven of twenty-four eyes enucleated for glioma were pseudo-glioma. In the case reported all the clinical symptoms were present with one exception—the tumour mass did not show vascularization, which is the rule.

Recurrences.—The prognosis on the whole is very bad. It is only favourable when operation is done early and when the tumour

does not extend beyond the retina. At least three years must elapse after enucleation before we can count on a permanent cure. In the meantime the other eye may become affected or metastases may take place. We can count on a permanent cure only when the optic nerve is intact and the tumour is confined to the retina. The percentages of recovery given are small. Hirschberg figures on 6.5 per cent.; Wintersteiner 13.7 per cent.; Vossius 10 per cent. In the Moorfields Hospital report the percentage of cures is not given on account of the difficulty of tracing some of the cases, but Berrisford considered 9 out of the 41 cases enumerated by him as cured, more than three years having elapsed since enucleation.

Fuchs, in his text book, states that three cases of glioma have been reported as recovering spontaneously by shrivelling. De Kleijn[13] reported 18 cases of glioma retinae operated upon in Utrecht with eight recoveries. In four of these recoveries the optic nerve was free; in two the affection was peripheral; in one the optic nerve was completely involved as far as the section; in one the amount of involvement is not stated. In the case where the optic nerve was involved the other eye became blind later and had to be removed.

Seventeen cases were reviewed by Hirschberg, of which ten at the time of operation had not extended beyond the retina, and in none of these latter had a relapse occurred during a period of from 5 to 13 years subsequent to operation.

The radium treatment was carried out in the Department of Radiology and Electro-therapeutics of the Provincial Royal Jubilee Hospital, Victoria, B.C., under the direction of Dr. L. K. Poyntz. Dr. Poyntz thinks that while there are grounds for supporting the view that the more malignant a tumour is the more vulnerable it is to massive radiotherapy, yet it must be admitted that the rays may stimulate rather than destroy tumour masses. It is possible that radium had a stimulating effect in the present case.

Dr. Poyntz thinks that it is probable that a preparatory irradiation before enucleation, complete fulguration of the contents of the orbit at the time of operation, if followed by intense radium treatment of those sites where recurrence is more common, might be a rational treatment of this type of case.

Verhoeff[15] quite recently reported that there were in literature only two cases in which an eye containing a glioma retinae was treated by radiation with apparent success. These cases were reported by Hilgartner and Schoenberg. Verhoeff himself reports a case in which, six months after enucleation of the right eye for glioma, followed immediately by severe X-raying, a tumour developed in the left eye. This was immediately treated by

X-rays. This tumour, though it had given rise to intraocular metastases, had not invaded the optic nerve. Although Verhoeff had not the opportunity to verify this tumour histologically he thinks there can be little doubt that it was a glioma. Although it persists yet the child's vision following the X-ray treatment appears to be perfect for the 3½ years following treatment.

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CENTRAL SCOTOMA IN ANTERIOR UVEITIS*

BY

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AT the Manchester meeting on October 14, 1921, I read a preliminary note on this subject and showed a case (No. 1).

The disease is that frequently described as irido-cyclitis with the so-called keratitis punctata. I do not wish to attempt to deal either with its causation or its treament, both of which are obscure, but rather to record some personal observations on the occurrence of a definite central or paracentral scotoma. The scotoma in the cases recorded is not due to any diseased state at the posterior pole which the ophthalmoscope would reveal.

The scotoma may be relative or absolute, evanescent or permanent.

The explanation is as yet not quite clear. At present my view

* A paper read at the Sheffield Meeting of the North of England Ophthalmological Society, November 11, 1921.

is that the scotoma is due to a toxic influence on the retinal elements at the macula, and secondarily on the papillo-macular band of nerve fibres.

This theory does not seem too far fetched, for it is well known that toxic substances of either definite chemical combinations, or of the more elusive biochemical ones, an instance of which is found in diabetes, can produce a scotoma.

In my humble opinion, all forms of inflammation other than directly traumatic, affecting the uveal tract are due either directly or indirectly to micro-organisms or toxins, and it would not be surprising if the same toxin were to damage the retina or the papillo-macular bundle.

I have not gone fully into my private records, but have in mind the four following cases.

I am of the opinion that in a proportion of the others where the visual acuity has been considerably lowered without obvious reasons apparent in the media, a central scotoma would have been found had the idea occurred to one to examine for it.

I propose making a fuller investigation at a future date, but the four serve to illustrate the point.

Case I—Female, now aged 34. The history is long, as she has been under my care since 1907.

When first seen on September 20, 1907, the left eye had been affected six months, but had had no treatment beyond a lotion. She had had no definite illness, although she had been always a delicate child. The father had died of phthisis.

The R.V.=6/6. No Hm. J. 1 and the L.V.=hand. The diagnosis of left iridocyclitis was made at once. " K.p." was marked in left eye on January 3, 1908. The right eye showed some haze in the media and irregularity of the pupil, but the vision was 6/6. The left eye was tender. No red reflection. On January 28 left eye T + 1. Cornea finely pitted. *Iris bombé* above. Atropin and dionin were used locally. On January 7, 1908, the right eye presented some " k.p.," but the left eye had improved. The iris was now in normal position, not *bombé*, and the details of the fundus visible.

Ten months later, i.e., in December, 1908 :—

R.V. = 6/24 $\bar{c}$ + 1 D. sph. = 6/9 and J. 4.

L.V. = J. 20 $\bar{c}$ + 1 D. sph. = 6/60 and J. 20.

On November 16, 1909, right iris was *bombé*.

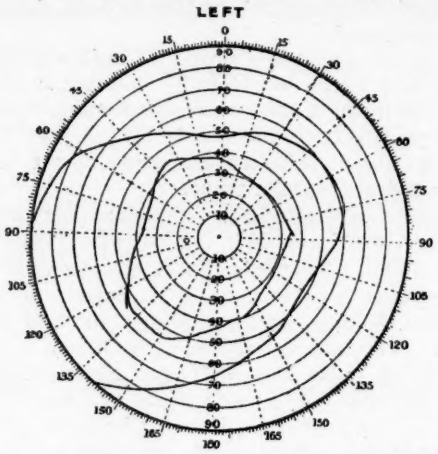
On February 3, 1910, R.V.=hand and L. with a weak + cyl.= 6/9 and J. 1. The right showed " k.p." and a dull red reflection only. Left eye haze on anterior capsule, pupil medium and fixed. No fundal disease.

On November 3, 1910, the R.V. had gone down to P.L. and

the L.V. was 6/6 partly and J. 1. So far, treatment had been with mercury, but in 1911 tuberculin emulsion was administered, and the injections were continued for many months. An iridectomy was performed on the right eye, hypopyon followed, and eventually the right eye was so tender and painful that it was removed. Attempts were made by tapping the anterior chamber of the left eye to find the micro-organism causing the lesion, but without tangible result.

The central scotoma was first noted on September 25, 1913, when the vision of the left eye had gone down to hand movements.

On January 5, 1914, L.V. = J. 20 with central scotoma. An indistinct patch of choroiditis was noted at the inner periphery.



CASE I.—Annie B., Oct. 28, 1921. Peripheral field for white.

In 1913, capsules of oleum caryophylli were administered for a long period, on the theory of an intestinal toxaemia.

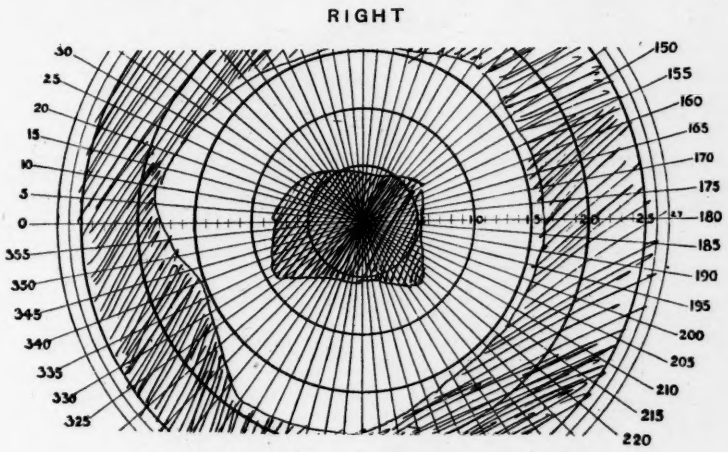
Later, injections of salvarsan were given, and the patient always thought that her sight was helped thereby, but the Wassermann test was negative.

Now the condition is:—Left eye quiet, a little fine brownish "k.p.," pupil medium size, excluded with a finely serrated margin. A thin film covers the anterior capsule of the lens, but numerous very fine brown dots are scattered on it. The V. = 6/36 and J. 10. The fundus and disc are easily seen; there is no pathological lesion.

The field, as taken by the perimeter, is moderately contracted (*vide* chart).

With Elliot's scotometer the field as taken by the small white bead is restricted to about 18° radius, but at the centre there is a large scotoma extending 5° to 8° from the fixation point.

As to the origin of the central scotoma here, I am inclined to regard it as being due to the toxin producing the iridocyclitis; but I feel, in justice to the theory, I must state that Mr. F. H. Westmacott, in 1914, reported rhinitis and hypertrophy of the middle turbinates, and recently he desired her to have an operation on the nose. Carious walls were found round the left sphenoidal sinus and thick cheesy pus in its interior. One cannot absolutely exclude, therefore, pressure on or infection of the optic nerve by the posterior ethmoidal or sphenoidal sinuses, and yet if that were the real cause one would expect the scotoma and consequently the sight to be worse now than formerly, but we remember in that



CASE I.—Annie B., Oct. 28, 1921. Scotoma for white.

year, 1914, the vision went down to hand-movements, and now it is 6/36 and J. 10.

Case II.—G. T. R., male, age 49. First seen August 1, 1917.

R.V. = 6/60 c̄ + 0.75 D. sph. ⌒ + 1 D. cyl. ax. vert. = 6/24 and c̄ + 2.25 D. sph. ⌒ + 1 D. cyl. ax. vert. = J. 10.

L.V. = 6/12 c̄ + 1.75 D. sph. = 6/6 and with + 3.25 D. sph. = J. 1.

There was marked episcleral injection surrounding the right cornea, but confined to one patch at outer side of left.

Evidence in each eye of small dots of anterior choroiditis. No definite vitreous opacities seen. Very doubtful mottling of left macula. The sight slowly failed, and on November 4, 1920, R.V. = hand and L. 6/24 and J. 6.

On the 17th of the same month I found slight haziness of disc and fundus due to vitreous cloud, but no gross lesion present. Septic

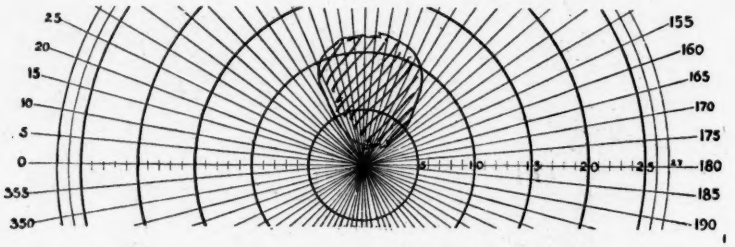
teeth were removed. Dr. Arnold Renshaw reported on a blood count that there was a slight anaemia which might be attributed to bacterial infection.

On December 23 last year the L.V. had gone down to 6/60. A fairly large paracentral absolute scotoma was found by Bjerrum's screen above the fixation point. Of course it is possible that the patient actually fixed the central spot on the screen paracentrally, and the scotoma was really central.

The patient was only a moderate smoker, but tobacco was stopped.

Thyroid and salicylates have been given as well as vaccines. In March last the scotoma had become smaller.

The right field was only present in the form of an inverted quadrant above fixation point.



CASE II.—G. T. R., Dec. 23, 1920. Originally taken on a Bjerrum's screen.

Here again we have a scotoma with no macular lesion apparent to account for it.

Case III.—S. H. B., male, aged 52. First seen April 23, 1918. Had had iritis in left eye in 1906.

R.V.=6/12 and J. 8 and L.=6/18 and J. 1 when corrected by lenses. R. eye began to be inflamed four days previously. The left showed posterior synechiae and haze in media. The right had typical iritis. On May 6 right iritis was subsiding and patient did not return till October 29, 1920, stating he had been struck in the right eye by a fragment of coke. There was no evidence of trauma, but there were signs of old iritis with a recurrence, and on November 11 fine grey " k.p." was seen.

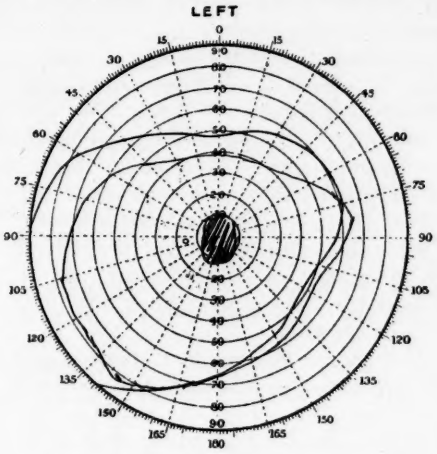
The acuity went down, and on November 26 a central scotoma for colour was found. Tobacco was stopped, and urine examined with negative result. No fundal lesion.

November 29, scotoma had enlarged and become absolute.

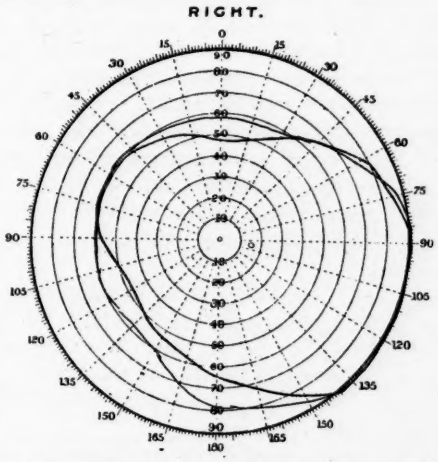
December 1, scotoma smaller.

December 9, further improvement. V.=J. 4, and by December 16 V.=6/9 and J. 1. No scotoma and no " k.p."

The cause in this case was possibly syphilis, but I did not suspect it from the clinical appearance, for I treated him with salicylates. Some friend of his sent him to a syphilologist, and he administered



CASE IV.—E. H. W., June 17, 1914. White.



CASE IV.—E. H. W., June 17, 1914. White.

salvarsan, however, after the scotoma cleared up, so the patient told me. The disappearance of the scotoma and the "k.p." coincided.

Case IV.—Mrs. E. H. W., aged 45. First seen in February,

1911. Had suffered from, and still has very marked rheumatoid arthritis.

Left eye frequent attacks of redness.

R.V. normal. L.V. J. 20. Right eye healthy. Left eye, exclusion of pupil and grey fine " k.p."

I thought the irido-cyclitis might be due to intestinal sepsis, and advised a course of emulsion of lactic acid bacilli prepared by Prof. Walker Hall, of Bristol.

On August 28, 1911, I found a large sector-shaped scotoma extending above fixation point. Treatment: Aspirin and thyroid.

May 13, the large central scotoma was still present, and was somewhat positive. Guiacol carbonate and solurol.

On June 20, 1913, considerable " k.p." in right eye, and vitreous haze, although the acuity was still 6/6 and J. 1.

Teeth again examined, some pyorrhoea alveolaris found. Ol. cinnamoni given in capsules.

In August, 1913, patient saw Sir A. E. Garrod and Mr. Goadby. Vaccines were prepared and administered. Later, had radium water.

On June 17, 1914, R.V.=6/12 fairly, but L.V. showed very large central absolute scotoma. Red seen at inner and outer periphery, and green and blue at outer periphery only, although both described as green.

Right eye showed a small central scotoma for colour.

No fundal lesion except hyperaemia of discs, and distinct fulness of retinal vessels, especially the veins.

Anti-rheumatic phlylacogen administered.

February, 1916, right eye: central colour scotoma persisted. Left eye: absolute scotoma as before.

March, 1917, same condition found.

In 1920 I met patient casually. She still complained of difficulty in any near work.

In all four cases, unquestionably, there was no accounting for the condition as being related to glycosuria. The second and third were smokers. In No. II no improvement took place on the cessation of a quite moderate use of tobacco. No. III quickly progressed from a small colour scotoma to absolute, and recovery was remarkably rapid.

I consider that quite possibly the moderate use of tobacco merely helped to accentuate the effect on the retinal elements, for both poisons, viz., tobacco, and the one I attribute the cases to, have, in my opinion, a similar action.

If all the improvement in No. III was due to tobacco cessation it is to be remarked that No. II did not recover in like manner.

ANNOTATIONS

Dangerous Colour-Blindness

A simple test for the segregation of those whose colour-blindness is of such a nature as to render them dangerous in navigating ships or driving railway trains has been long sought. In another column we publish a report to the Board of Trade on the Standard of Rejection for Colour-blindness for Seamen by Dr. F. W. Edridge-Green. All will agree that " any one who can distinguish between the red, green, and white lights at a distance of a mile has sufficiently good colour perception for the purpose of navigation at sea." Dr. Edridge-Green states that " about 5 per cent. of men will fail to distinguish between the red, green, and white lights of a properly constructed lantern, or with the actual lights themselves at a distance of a mile," and that " the lantern is therefore an efficient test." He supports his views with a re-statement of some parts of his familiar theories, and adds " it will be noticed that this standard is based only on facts." In our opinion this is a strained and unjustifiable use of the term " facts," but more important is the absence of any definite " standard." For difficulties immediately arise in practice. As laid down by the Departmental Committee of the Board of Trade (Cd. 6256) " if a candidate mistakes a red light for a green or *vice versa* he should be considered to have failed. . . . Other mistakes should be referred to the Board of Trade to determine whether any further examination is necessary." The " other mistakes " are: calling white red or green, calling red or green white, and none of these is uncommon. Further examination by suitable spectroscopic tests proves that these mistakes may be either trivial or serious, yet the lantern alone cannot definitely decide. Where then is the standard? The Departmental Committee rightly concluded that while the lantern test was excellent and sufficient to eliminate the worst cases of colour-blindness—those who call red green or *vice versa*—other cases demanded further examination by methods which could be applied only by experts. The panel of examiners for these " referred cases " included a nautical adviser, a physicist, and an ophthalmic surgeon. The Board of Trade adopted the recommendations of their Departmental Committee and these were in force until the appointment of Dr. Edridge-Green as a Special Examiner in 1920. As is well known, this appointment was tantamount to abandoning the recommendations of the Departmental Committee. The Board of Trade have hitherto given no reasons for taking this drastic and autocratic step. Dr. Edridge-Green's report cannot but raise grave doubts as to the efficiency of the methods now in use.

Prophylaxis of Trachoma

The Ophthalmological Society of Egypt in 1920 elected a Committee to study and report on the means of prophylaxis against trachoma and acute ophthalmias. This report has just been published in the Annual Bulletin of the Society. It is a serious effort to grapple with a condition of affairs as old as the Pharaohs and affecting a proportion of the population of native Egyptians which has been estimated to be about 90 per cent. From a study of the published Annual Reports of the Director of Ophthalmic Hospitals since 1912, it is clear that not only has there been an improvement in the incidence of trachoma and acute ophthalmias, but that by the agency of the Ophthalmic Hospitals, now twenty in number, a firm desire has been implanted in the minds of the educated population to proceed still further in the direction of universal facilities for ophthalmic treatment and adequate means of prophylaxis. So that the Ophthalmological Society's report should be considered rather as a response to a popular feeling than as a new trumpet call to modern ideas of health.

The English and the arrangement of the report are defective, but are nevertheless highly creditable to a body of ophthalmic surgeons, the native language of the majority of whom is Arabic.

A good many of the suggestions are such as will be found in the usual treatises on diseases of the eye, others are taken without acknowledgment from MacCallan's book, "Trachoma in Egypt." We are not in a position to give an opinion on the general sanitary measures recommended, nor on the advisability of introducing Universal Elementary Education for boys and girls, though they seem to be a sound foundation for the improvement of any generally illiterate people who, outside some of the largest towns, are unacquainted with even the rudiments of sanitary science.

MERCHANT SHIPPING. STANDARD OF REJECTION FOR COLOUR-BLINDNESS IN SEAMEN

Report to the Board of Trade by Dr. Edridge-Green

CONSULTATIVE BRANCH,
MERCANTILE MARINE DEPARTMENT,
BOARD OF TRADE,
68, VICTORIA STREET,
LONDON, S.W.1,
November 7th, 1921.

SIR,—I beg to enclose my report on the proposed Standard of Rejection for Colour-blindness for Seamen.

Captain Fulton, the Principal Examiner of Masters and Mates to the Board of Trade, entirely concurs with this report.

I am, Sir,

Your obedient Servant,

F. W. EDRIDGE-GREEN.

The Assistant Secretary,

Mercantile Marine Department, Board of Trade.

There is no universally recognised standard of rejection for colour-blindness since the wool test has become obsolete. With the wool test any one found to show any evidence of colour-blindness was rejected. *The wool test allows 50 per cent. of* dangerously colour-blind to pass and of those rejected 50 per cent. are not dangerously colour-blind.

The Nautical Advisers of the Board of Trade are agreed that any one who can distinguish between the red, green and white lights at a distance of a mile has sufficiently good colour perception for the purpose of navigation at sea.

The point, therefore, for consideration is the degree of defective colour perception corresponding to a failure to distinguish between the red, green and white lights used at sea at a distance of a mile.

About 25 per cent. of men have diminished colour perception in comparison with the remaining 75 per cent. As these cases form a complete series from total colour-blindness to super-normal colour perception the consideration is where the dividing line should be drawn and whether there is some special fact which will indicate the limit of safety. About 5 per cent. of men will fail to distinguish between the red, green, and white lights of a properly constructed lantern or with the actual lights themselves at a distance of a mile. These men will equally fail with other properly constructed tests, as for instance, my spectrometer or card test. An examination with the spectrometer shows that they may be ranged in three definite classes, the dichromic, who see only two colours in the spectrum, red and violet with a neutral division between them, the trichromic who see only three colours in the spectrum, red, green, and violet, and who designate the yellow of the spectrum as red-green, and those who have shortening of the red end of the spectrum. The spectrometer is the most convincing test in these cases. For instance, the trichromic will isolate a considerable portion of the yellow region of the spectrum containing to the normal-sighted orange-yellow, yellow and yellow-green and will state that it is one uniform band of colour.

A person of very acute colour-vision can distinguish seven colours in the solar spectrum, red, orange, yellow, green, blue, indigo, and violet. Those who have for all practical purposes normal colour-vision, six, five, or four colours, those who see six failing to distinguish indigo, those who see five, orange as well,

and those who see four, blue in addition. Those who can distinguish seven colours are called heptachromic and those of less acute perception, in descending order, hexa-, penta-, tetra-, tri-, and dichromic. The tetrachromic, or those who see four colours in the spectrum, red, yellow, green, and violet, though in continual difficulty about blue and green, have a definite yellow sensation and repeated and extended examinations with actual lights extending in some cases over five hours have convinced me that for practical purposes the tetrachromic are not dangerous. The possession of a definite yellow sensation is therefore the deciding point for passing as practically normal.

The lantern is therefore an efficient test and cases of acquired colour-blindness, as for instance those with central colour scotoma, are also excluded, as well as those due to defective light perception such as shortening of the red end of the spectrum.

It will be noticed that this standard is based only on facts.

According to my experiments this standard is safe for a greater distance than a mile and will tend to diminish and not increase the number of candidates rejected.

ABSTRACTS

I—CONGENITAL NYSTAGMUS

Haïri, H. (Geneva).—Congenital latent nystagmus. (Nystagmus latent congénitale.) *Revue Générale d'Ophtal.*, April, 1921.

In a somewhat long and rather speculative article **Haïri** discusses what he denominates latent nystagmus of congenital origin. This must be distinguished from latent nystagmus of acquired type, such as comes on only under certain circumstances as in coal miners or certain professional occupations. The definition of the congenital type is, according to the author, "A trembling of one or both eyeballs, which becomes manifest on covering one eye." The leading work on this subject is that of C. and H. Fromaget (*Ann. d'oculist*, 1912). These writers supposed that their case was unique, but Haïri shows that that is far from being the case, he having found cases recorded as far back as that of Faucou in 1872. Nevertheless, the literature is not very large and includes, in addition to continental writers, the names of Brewerton, Grimsdale, Clarke, and E. Thomson in Great Britain. In his explanation of the pathogenesis the author gives schemata to indicate the nerve paths between the cortex, the supranuclear and the nuclear centres, and the eyeballs. These diagrams show how direct central

control through the nuclear centres may be substituted for control through the supranuclear centres, which latter, however, have not yet been anatomically located. The principal conclusions come to are the following:—(1) The motor ocular apparatus consists of cortical, supranuclear and nuclear centres; (2) movement of one eye is possible because in addition to the normal nerve bundles between the cortex and the supranuclear centres there are direct communications between the cortex and the nuclear centres; (3) the slow and the rapid phases of nystagmus have different origins. The former is under the influence of the supranuclear, and the latter of the cortical centre; (4) disturbance of the mechanism takes place in congenital latent nystagmus because when one eye is covered its influence upon the congenitally insufficient supranuclear centre of the opposite side is suppressed; and that is why the slow phase of congenital latent nystagmus is directed towards the side of the covered eye and the rapid phase to the opposite side. In order fully to understand this theorem reference must be made to the original, p. 161, and to Schema No. 2, which shows the nerve paths; (5) nystagmus (of the "spring" type), whatever its origin, becomes less or ceases as soon as the direction of the eyeballs coincides with the direction of maximum pathological deviation, and nystagmus occurs whenever the direction of the eyeballs deviates from the direction of maximum deviation, the amplitude of the nystagmus being directly proportional to the amount of this deviation of the eyes from the direction of maximum deviation. This is why the nystagmus increases in intensity when the patient directs his gaze to the side opposite the covered eye, and diminishes or ceases when attention is directed to the side of the covered eye.

Those interested in the mechanism of nystagmus would do well to study this whole article in the original, for in addition to what the author has to say regarding latent nystagmus there is a good bibliography.

ERNEST THOMSON.

II—THE THOMAS YOUNG ORATION

Sheard, Charles (American Optical Company).—The Thomas Young Oration: "Some important Physical and Physiological Relationships between radiant energy and the Visual Apparatus and Processes." *Trans. of the Optical Society*, 1921-1922, Vol. XXIII, No. 1.

We have received an advanced proof of **Sheard's** article which we have read with pleasure. The first part of the oration is mainly concerned with the marvellous man, Thomas Young, who, in the

words of Tscherning, " played the rôle of first man in so many different branches of science." . . . . " For his own reputation it would certainly have been better if Young had completely developed but one of his ideas. But for the advancement of science it was better that he did as he did. For, if the second man is not frequently met with, the first one is extremely rare." In the second portion of the oration Sheard passes to the consideration of the various theories of vision, and in this we shall not attempt to follow him in abstract. It is interesting to note that he estimates at " sixty or more " the number of theories of the mechanism of visual response.

When speaking of Young and the discovery of astigmatism the orator mentions the methods of determining the amount and the axis of astigmatism, and the following paragraph occurs which is of such practical application that it seems wise, in the interest of the reader more interested, perhaps, in practical methods than in theories, to transcribe it rather fully. " An eye which has an insufficient resolving power shows, in general, three defects:—(1) a marked loss of power to sustain the adjustments needed for clear seeing; (2) an undue lag in making the adjustment necessary for clear seeing; and (3) the fact of increased amount of light required initially to discriminate details in the standard acuity object. In the past we have quite commonly pursued methods of examination of ocular defects involving changes in visual angle rather than illumination. But, in so far as the test object is concerned, clearness of seeing depends upon both the visual angle subtended and the illumination. Hence, either the visual angle scale or the illumination scale may be used for the detection of the defects of the eye considered as an optical system, i.e., the visual angle may be varied and the illumination kept constant or the converse. The illumination scale, however, possesses the greater sensibility for the detection of small errors, and from recent experimentation we are satisfied that visual radiant energy, i.e., illumination, constitutes the superior method in detecting the exact amount—and, in the case of astigmia, the placement of the correcting cylinder—of visual interference which exists because of physical defects of the eye as an instrument. For if the eye has an equal resolving power in all meridians, the amount of light required just to discriminate a test object in all meridians will be the same; if the resolving power is not equal, the amount of light will be different in the various meridians and different by an amount proportional to the amplification represented by the illumination scale. In particular is this true in the determination of the amount and the exact placement of the correction in cases of low astigmatisms. Clinical methods as ordinarily pursued may vary easily in conclusions from 0.12 to 0.25 D. in strength of cylinders and, in

the case of low astigmatism, from 5 to 20 degrees in the placement of the cylinder axis. These inaccuracies may affect keen acuity, speed in the use of the eye, speed of discrimination and in the adjustments of the eye for clear seeing at different distances. And the resolving power is of importance in expressing the difference in the amount of light that is required by different people as a working minimum and is of particular significance in explanations of acuity in twilight conditions and doubtless also in " night-blindness," so called. Experimental tests made by several workers —and these results have been largely verifications of the work of Ferree and Rand—show the superiority of the illumination scale for the detection of the exact amount and placement of the cylindrical corrections. To indicate the sensitiveness of this method let us cite a condition in which, with +0.12 Cyl. ax. 55 degrees, it was found that equal illumination was required for the discrimination of the test object in all meridians. Clinical methods, as ordinarily pursued, gave +0.25 Cyl. ax. 70 degrees. . . . From a study of these illumination scale methods and from a first-hand acquaintance we feel that greater accuracy will be forthcoming in the future in the detection and correction of errors of refraction, and especially in the application of illumination methods to astigmatism, the error of the eye first discovered and measured by Thomas Young approximately a century and a quarter ago." So far as the reviewer is aware, such a method as that indicated in the paragraph above transcribed is not in general use in this country, and seems well worthy of investigation.

ERNEST THOMSON.

III—REMEDIES

(1) **Story, J. B. (Dublin).—Trachoma treated by the Sculco method.** *Trans. Ophthal. Soc. U.K.*, Vol. XL, 1920, p. 437.

(1) **Story** does not enter into details of Sculco's treatment, but recounts the case of a girl, aged ten years, suffering from severe trachoma of both eyes, treated with the usual remedies with little effect. He then applied Sculco's remedy to the lids of the patient's right eye, which was considerably the worse of the two, and showed the case at the Irish Ophthalmological Society when the treatment had been in force ten days only. Members agreed that the right eye was then the better of the two.

S. S.

(2) **La Jerba, G. A. (Catane).—The method of Sculco in the treatment of trachoma. (La méthode Sculco dans le traitement du trachoma.)** *La Clin. Ophtal.*, March, 1921.

(2) The method of Sculco is probably not well known in this country. **La Jerba's** contribution may, therefore, be of interest. The treatment consists in the application to the everted lids of a vegetable ferment extracted from *Nepeta citriodora* with the addition of resins and glucosides of *Thymus serpillum* and *Salvia officinalis*. The two last named stimulate phagocytosis and increase the microbicide efficacy of the ferment. The combination is dosed and diluted in an indifferent vegetable powder. The remedy has its chief use in non-recent forms of trachoma complicated with pannus. It is of no particular value in the early stages of the disease and in the papillary form of it. It has wonderful power in the clearing up of pannus. This action is due to the phagocytosis produced by the Nepeta ferment. The details of the method of application should be sought either in this article by La Jerba or in Sculco's original communication to the Royal Academy of Medicine and Surgery of Naples, in June, 1916. These details are of a somewhat precise nature.

ERNEST THOMSON.

(3) **Rossi, Dr. V. (Naples).—Action of extract of lymphatic glands on glaucomatous human eyes. Preliminary note. (Azione dell'estratto di ghiandole linfatiche su occhi umani glaucomatosi. Nota preventiva.)** *Arch. di Ottal.*, March-June, 1921.

(3) **Rossi,** in this paper, gives some account of results obtained in lowering pathological ocular pressure by the use of extract of lymphatic glands. He was led to use it on account of its action in lowering general blood pressure when injected intravenously. The extract (no details of its nature are given in the present paper) was instilled as drops in two cases of chronic glaucoma and in one of absolute glaucoma. In one of the chronic cases the tonometer showed a very considerable reduction of pressure, in the other two a moderate amount. In none of the cases was there any effect on the vision or the size of the pupil.

In these cases no measure of the general blood pressure was made, but Rossi hopes to do this later. In the meantime he feels able to state that extract of lymphatic glands in repeated instillations definitely lowers the intraocular pressure, but not immediately, only after the lapse of twenty-four hours.

E. E. H.

(4) **Lemoine and Valois (Nevers).—Nascent iodine in inflammations of the lacrimal passages. (L'iode naissant dans les inflammations des voies lacrymales.)** *La Clin. Ophtal.*, May, 1921.

(4) In simple cases of inflammation of the lacrimal sac, when there is only lacrimation or slight secretion—in fact, in cases where excision of the sac is not indicated—**Lemoine** and **Valois** have employed nascent iodine with good effect. The technique is very simple. After instillation of cocain and digital expression of the sac contents, a 10 per cent. solution of iodide of potassium is injected two or three times by the puncta, so as to cleanse the sac thoroughly. Thereafter a small quantity of " oxygenated water " (which one gathers from the text is one part of hydrogen peroxide to two parts of water) is injected. The operation is quite painless, but to avoid any conjunctival reaction a pledget of cotton should be held at the puncta during injection to absorb any reflux, and after the injection the conjunctival sac should be washed out with boiled water. The quantity of iodine liberated is insufficient to cause irritation (? of the mucous membrane of the sac) so that the treatment can be repeated frequently. The reaction which takes place is the well-known one: $2KI + H_2O_2 = 2KOH + 2I$, although there is a misprint in the equation as stated by the authors.

ERNEST THOMSON.

(5) **Jocqs, R. (Paris).—A few words regarding injections of milk. (Quelques mots sur les injections de lait.)** *La Clin. Ophtal.*, May, 1921.

(5) The treatment of ocular inflammatory diseases by parenteral injections of sterilized milk has been before the profession since 1916, when Müller and Thanner, of Vienna, published their work on the cure of iritis and other ocular affections by this method, which, it may be noted, they styled " parenteral injections of albumin (sterilized milk)." It is probable that not much has been done in this country with this method; therefore it is interesting to have the considered views of **Jocqs** as to its results. These injections, which have been employed in most of the inflammatory diseases of the eye, have given very encouraging results, but they do not constitute a panacea. In gonorrhoeal conjunctivitis and interstitial keratitis the results have been uncertain, but in various severe cases of iritis, iridochoroiditis, infective ulcers of the cornea, and post operative or post traumatic infections of the eyeball injections of milk have given more constant and rapid success than serum treatments, such as the antidiphtheritic serum treatment recommended by Darier, good as the latter have been. It is worth noting that Jocqs is careful to point out that injections of milk

had been used in general medicine long before 1916 when Müller and Thanner introduced it for eye work; in France at any rate as far back as 1903. Nevertheless, one gathers that French medical men have not adopted the method very seriously. In Spain, on the other hand, a great deal has been done with it by M. Marin Amat, whose work is specially referred to in this article.

ERNEST THOMSON.

(6) **Mazzei, Dr. A. M. (Naples).—Milk in ocular therapy. (Il latte nella therapia oculare.)** *Arch. di Ottal.*, July-August, 1921.

(6) **Mazzei** in the paper under review gives notes of several cases in which he has made use of sub-conjunctival injections of milk. He divides his cases into three groups:—

1. Conjunctivitis and phlyctenular keratitis. 2. Interstitial keratitis. 3. Vascular trachomatous pannus.

He finds that sub-conjunctival injections of milk produce a violent local reaction (oedema of the lids, conjunctival chemosis and enlargement of the preauricular gland), which lasts four or five days and should be treated by warm fomentations. He finds that the greater the reaction the more marked is the beneficial result. He used doses of about a cubic centimetre and did not notice any general reaction. Of his three groups, one and three showed great improvement, but group two (interstitial keratitis) not only showed no improvement, but two of his cases were made distinctly worse by the treatment. He considers that the milk acts as a phlogistic stimulus, activating the local defensive elements.

E. E. H.

(7) **Fradkine, Jacques.—The "miracle" of milk in ocular therapy. (Le "miracle" du lait en thérapeutique ophtalmologique.)** *La Clin. Ophtal.*, August, 1921.

(7) Have we in this country paid sufficient attention to the use of injections of sterilized milk in infective ocular conditions? It is now some considerable time since there has been reference, in French literature at any rate, month by month, to cases of this kind successfully treated by the use of these injections. The method seems to be of the utmost simplicity and to cause a minimum of reaction. In the article at present under consideration, **Fradkine**, admittedly a doubter when he first commenced the treatment in 1918, appears to have become quite converted to it. The article refers especially to a particular case in an old man—dare one so designate him?—of 70 years, who suffered from a hypopyon ulcer of the cornea and accompanying iritis. The cautery and subconjunctival injections of cyanide were purposely

omitted by the author, and the treatment was confined for the first day to atropin, argyrol, and methylene blue locally. On the second day, the condition being very decidedly progressive, the first injection was given—3 cubic centimetres of milk into the abdominal adipose tissue. From this point healing was continuous in spite of the fact that the patient was 70 years of age and did not in the least do what he was told as regards rest in bed and so on. A second injection of milk was given on the third day, and a third (5 cubic centimetres) on the fifth day. This was the last injection given, the local treatment being continuous right through, and the patient was dismissed practically well on the ninth day. Fradkine, however, is not content merely to relate the case. He has taken the occasion to make a logical enquiry as to the biological mechanism of the milk treatment. Into this we can hardly follow him in a brief abstract, but the sum and substance of the matter, leaving out the intermediate steps of the argument, is that " the milk miracle is explained solely by the fact that one introduces into the serum of the organism a rich quantity of alexines which shall destroy the microbes, already sensitized by their specific fixation agent. Hence the remarkable indifference to the *kind* of microbe which is exhibited by all writers. It is not, in fact, a question of a specific medicament for a given race of microbes, but of an aspecific substance, alexine, which is wonderfully active on any kind of bacterial element. . . . Possibly the special advantage of milk lies precisely in its great richness in alexines."

ERNEST THOMSON.

(8) **Hokema, Lessan (Teheran).—A case of severe hyalitis much improved by injections of milk. (Un cas d'hyalite grave très amélioré par les injections de lait.)** *La Clin. Ophtal,* August, 1921.

(8) By a somewhat curious coincidence the same number of *La Clinique Ophtalmologique* which contains Fradkine's explanation of what he calls " *le miracle* " of milk in ophthalmic therapy, contains also an account by **Hokema** of what sounds, indeed, very like a miracle. The case is one which is described as severe hyalitis which had received already a series of courses of arsenical and mercurial injections which had done no good at all. There was, indeed, no suggestion of syphilis, the patient being the father of nine healthy children who exhibited no stigmata, and the Wassermann reaction negative. On March 17, 1921, the patient was given an injection of two cubic centimetres of sterilized milk. On March 20 he was able to read the third line of types at 5 metres, whereas for five months previously he had not been able to read the first line. A second injection of 5 c.c. of milk was followed by considerable reaction, and three days later by ability to

read the fifth line of types at 5 metres. Nine injections were given altogether at intervals of three days and not exceeding 5 c.c. After the ninth injection the patient read the eighth line of types at 5 metres. The ophthalmoscope now showed the media to be only slightly less transparent than those of the fellow eye, which was healthy. There was no visible lesion of the retina or choroid, and the optic nerve was almost normal. Vision, which had been nearly lost, was now nearly re-established. It is to be noted that the writer is somewhat indefinite as to the exact actual vision. A statement as to the number of lines of type read does not constitute an accurate method of recording, although presumably the eighth line is equivalent to about 5/5.

ERNEST THOMSON.

(9) **Coppez, Henri.—On a new excipient for ophthalmic ointments, having a base composed of cholesterinated vaseline.** (**Sur un nouvel excipient pour pommades ophtalmiques à base de vaseline cholestérinée.**) *La Clin. Ophtal.*, August, 1921.

(9) The following is a translation of the article by Coppez:—

The chief preparations required in ocular medicine ought to be perfect, not only as to dosage, purity, solubility, or strength of the medicaments employed, but also as to the neutral character and the stability of the fatty vehicles.

Melted butter, cerate, and benzoated lard have been definitely given up because industry, with improved appliances, can supply us with absolutely pure neutral vaselines.

An objection to vaseline is that it varnishes the skin and the mucous membranes and hinders absorption of the medicaments which are incorporated with it. The addition of lanoline to the vaseline remedies this fault; lanoline forms an emulsion with the tears and the conjunctival secretions and is absorbed by the conjunctiva. Yet lanoline is by no means a product of definite type and composition like vaseline. Every practitioner knows how many varieties of lanoline of different appearance and consistence are to be found to-day in the drug trade. That variety, of course, depends upon the number of commercial greases of a composition varying with the race and habitat of the sheep. According to Gilkinet the constituents of wool fat may be divided into two categories.

The first, wool-wax (*cire de laine*) contains solid fatty acids, and a liquid acid which is probably oleic, combined with cholesterine and alcohols of low molecular weight.

The second category, soft wool-fat (*graisse molle de laine*) which amounts to 85 to 90 per cent. of the whole, contains a high proportion of oleic acid, fatty acids, alcohols of high molecular

weight and a combination analogous to isocholesterine. The soft fat contains no trace of free cholesterine nor of stearic or palmitic acids.

Lanoline only contains, then, 10 to 15 per cent. of emulsifying principles in the form of a complex of cholesterine ethers, fatty acids combined with alcohols, and free cholesterine. This combination only is hydrophile, the remaining 85 to 90 per cent. is not.

If it is true that in ocular therapy medicaments should be selected with care and discernment it is an obvious indication that we should make use, not of the 10 to 15 per cent. of emulsifying bodies which it would be troublesome to separate from the 85 to 90 per cent. of dead weight which accompanies them, but only of the crystalline body which represents them, namely, cholesterine.

Classed by biologists among the non-phosphorized lipoids, cholesterine forms a colloidal solution with water; and the preponderating rôle of colloids in inter- and intra-cellular exchanges is well known. The ocular fluids are emulsified with greater certainty by cholesterine than by lanoline, for the simple reason that the former is much more hydrophile than the latter. Lanoline is capable of absorbing double its weight of water, cholesterine about 100 times its weight. If 3 per cent. of cholesterine is added to vaseline, a mixture is obtained of which the hydrophile character is perfect from the ophthalmic standpoint.

Cholesterine is anti-haemolytic and protects the cells against the action of haemolysins, bacteria, or toxins; it is an integral part of animal cells. In ocular therapy it is much better to employ cholesterine than wool-fat because dosage is more precise with the former owing to its crystalline physical state. Owing to its colloidal hydrophile nature, its anti-haemolysing and anti-toxic action, and its physico-chemical stability, it will become the ideal vehicle for medicaments prescribed by the ophthalmologist.

ERNEST THOMSON.

(10) **Van Lint (Brussels).—Primary blepharospasm cured by injection of alcohol at the lower-outer border of the orbit. (Blepharospasm essentiel guéri par injection d'alcool au rebord inféro-externe de l'orbite.)** *Arch. d'Ophtal.*, October, 1921.

(10) The author believes that there is only one certain cure for this variety of blepharospasm, and that is injection of alcohol into the facial nerve at its exit from the temporal bone. But the paralysis which ensues is perhaps more troublesome than the muscular spasm. Being complete and involving both divisions of the nerve, it leads to loss of power in the muscles of the cheek and lips, while the paralysis of the superior branch causes lagophthalmos and exposes the eye to almost constant epiphora and to the risk of

keratitis. He endeavoured to discover a method whereby the paralysing effect of alcohol could be limited to the orbicularis palpebrarum. If successful the blepharospasm would be relieved, but there would be no interference with the buccal musculature. He aimed at obtaining as a permanency the effect on the orbicularis induced transiently by the injection of novocain. In the paper under review **Van Lint** records the case of a man, 55 years of age, with blepharospasm of four years' duration, treated by injection of alcohol into the nerve fibres innervating the orbicularis in their course along the lower outer border of the orbit. The result was very satisfactory. Three months afterwards there was no spasm of the orbicularis and winking movements were normal. The palpebral aperture appeared to be a little wider than before treatment. The author expresses some doubt as to the permanence of the cure, thinking that an interval of three months is not long enough to exclude a relapse. But the result is one which will encourage other surgeons to try his method in this most intractable malady. Those who wish so to do should consult Van Lint's paper for exact details of the technique he advises.

J. B. LAWFORD.

BOOK NOTICES

Cataract and its Treatment. By HENRY KIRKPATRICK, M.B., Lieut.-Colonel, Indian Medical Service, retired. London: Oxford Medical Publications. Henry Frowde and Hodder and Stoughton, 1 & 2, Bedford Street, Strand. 1921.

This valuable monograph embodies an exceptional experience of responsible practical work in India. Of any retiring Professor of Ophthalmology of the Madras Medical College it ought to be true, so far as cataract work is concerned, that "what he doesn't know is not worth knowing." Wisely there is no attempt at text-book elaboration; the author expresses the modest hope that the book may be of service to the civil surgeon in India.

The early chapters deal with the development, anatomy and nutrition of the lens, the histological, physical, and chemical changes in cataractous lenses; the aetiology and varieties of cataract. The clinical varieties of senile cataract are divided into the swelling or liquefying, the shrinking, and the hypersclerotic types. Though it is not definitely stated, the first of the three varieties, which develops rapidly and passes on into the Morgagnian stage, is much commoner in India than in temperate climates. And this fact accounts for certain features of Indian work.

The symptoms, physical signs and diagnosis of cataract are given, and its non-operative treatment.

The first chapter on the operative treatment of senile cataract contains a brief discussion of the questions of intra- or extra-capsular extraction, and of the simple or combined methods. These and some other discussions in the book are perhaps a trifle colourless, from the author's apparent reluctance to indicate personal preferences and convictions. The beginner may feel the want of more definite guidance. But he obtains this indirectly from the arrangement and relative fulness of the practical descriptions. The method selected for full and complete description is the ordinary "combined" operation. In the plain straightforward account of the various steps of the operation, with the preliminaries, preparation and after-treatment, lies the chief value of the book. The most experienced surgeons may consider with advantage the clear and concise directions given by a careful and conscientious observer, who for a number of years has had every opportunity of perfecting each detail of technique. It has been Col. Kirkpatrick's duty to search for the best and to test it fully. There may be many ways of carrying out each act more or less well, but one feels that one can rely on the way here chosen as essentially sound and effective. The author shows a well balanced judgment, and may well claim to speak with authority. The illustrations from photographs showing the positions of the surgeon's and assistant's hands are useful.

There have been developments in India which have never been sufficiently appreciated here owing to the fact that they have been largely the result of special conditions in patients and surroundings. Col. Kirkpatrick fully appreciates the value of maximal perchloride irrigation of the conjunctiva. With its help the Madras Hospital is able to record only twelve cases of suppurative panophthalmitis in over five thousand extractions; and four of the twelve suppurations began after the ninth day, and were therefore secondary infections. It is very difficult for surgeons in this country, who perform relatively few operations, to realize their responsibility for a small percentage of avoidable infective losses.

One of the difficulties in Indian work is from the want of control shown by many of the patients. Hence (1) the pains taken to secure complete local anaesthesia, and (2) the development of Smith's lid control and its modifications. The use of both of these safeguards is likely to spread.

In Madras a sub-conjunctival injection is made of two drops of 4 per cent. cocain solution, mixed with two drops of 1 in 1,000 adrenalin chloride solution and four drops of normal saline; this in addition to four cocain instillations. In spite of the anaesthesia

thus obtained, it is necessary in Madras to guard against attempts at " squeezing " and unsteadiness. Col. Kirkpatrick makes repeated reference to the constant control of the orbicularis after the section has been made. It may be news to many that under Smith's control the safest position during expression of the lens is with the eye looking upwards.

The Madras method of lacerating the lens capsule before making the corneal section has been in constant use there for over thirty years, but it does not seem to appeal to surgeons elsewhere. Irrigation for the removal of detached cortex is practised regularly in Madras, as it was, and probably still is, in Bombay. It is of great use for swollen lenses with much soft sticky cortex, and for the detached rims of many over-ripe shrinking cataracts; but neither of these developments is commonly seen in England.

Though otherwise very good, the account of the treatment of after-cataract appears to the reviewer to miss the main point. The want of due emphasis on the importance of the thread of vitreous which so often occupies the needle-puncture unseen, renders the description as a whole somewhat flat and unprofitable. The omission of full provision against this danger is still at times responsible for infective results which can only be considered appalling. Yet it has been conclusively shown that the danger can be fully overcome by effective conjunctival antisepsis, together with a sufficiently sub-conjunctival needle or knife puncture, the sub-conjunctival track being afterwards flattened out by pressure. Upon this question of absolute safety of " needlings " may hinge ultimately the question of intra- or extra-capsular removal of cataract.

The book should receive a hearty welcome in India, as well as here and in America. There is quite room for such an authoritative unbiassed account of present-day practice.

Pathologie Oculaire. Histo-pathologie de l'oeil et des annexes. By V. MORAX, pp. 447, 208 illustrations. Paris: Libraire Félix Alcan, 108, Boulevard Saint-Germain, 1921. Price, 45 fcs. nett.

This volume, originally intended to form a chapter of a large work on morbid anatomy, the publication of which was prevented by the war, is chiefly remarkable for the number and excellence of its illustrations.

In an opening chapter the author deals with the practical side of the subject, describing briefly, in their various stages, the methods which should be followed in preparing secretions and tissues for microscopical examination. Here we note with interest his assertion that he has proved the superiority of Zenker's fluid

over other fixatives for ensuring good cellular fixation in all the tissues of the eyeball.

The usual anatomical classification of the various parts of the eye is adopted, a separate chapter being devoted to each structure, including the eyelids and the lacrymal apparatus. Each chapter opens with a section on the normal histology of the part, congenital malformations are next described, and finally the various diseased conditions are dealt with under their separate headings.

Apart from mentioning a few clinical facts the author confines himself almost entirely to morbid anatomy. Sometimes he refers briefly to certain theories which have been advanced to account for morbid conditions; for example, in the section on detachment of the retina, but for the most part he ignores theory altogether, as when describing primary glaucoma and sympathetic ophthalmitis. Bacteriology is briefly touched upon in appropriate places.

The book deals fully with the morbid anatomy of the eye, with brevity and clearness. To advanced students it should be invaluable as a text book, even to those whose knowledge of the French language is rudimentary, because of the quality of its illustrations.

There is a well-arranged bibliography divided into sections which correspond with the titles and sub-headings of the chapters. It would, however, be much more useful if it were more up to date.

CORRESPONDENCE

HOLTH'S IRIDENCLEISIS

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—Will you allow me to correct a serious error in the opening paragraph of Professor Holth's article in your December issue (p. 544). He writes:—" . . . especially after sclero-corneal trephining, where, according to American operators, late infection occurs in about 7 per cent. of the cases." The reference is to Fuchs' Text-book of Ophthalmology, 6th American edition by Duane, 1919, p. 512.

Duane makes it absolutely clear that he is speaking of sclerectomy as a whole, and not of any single operation, and what he actually says gives an entirely different meaning from that conveyed in the above words.

After discussing the filtering scar of sclerectomy, he writes:—" It must be admitted, however, that such a cicatrix is more liable to the danger of late infection than is a solid cicatrix.

(Sclerectomy, more particularly in the form of Elliot's trephining operation, has largely superseded iridectomy in cases of simple and also often in cases of chronic congestive glaucoma. Recently there has been a tendency to return to iridectomy even in these conditions—this partly because of the danger of late infection, referred to above, *which, according to some*, occurs in some 7 per cent. of the cases.)"

The italics are my own. I do not think I need comment further on the matter.

Yours truly,

R. H. ELLIOT, LIEUT.-COL. I.M.S. (Ret.)

January 29, 1922.

COLLOSOL ARGENTUM (FOR THE MEDICAL PROFESSION ONLY).

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—As we get older, the healthy scepticism of youth passes through the more tolerant atmosphere of middle age into the indifference of the aged; even so, I think that few ophthalmic surgeons will subscribe to the opinions expressed on page 19 of the small brochure which has been recently sown broadcast (by the proprietors of collosol argentum) through the profession.

With the main portion of the contents of this pamphlet ophthalmic surgeons are not concerned, but in that part of it devoted to collosol argentum in ophthalmic surgery, the following statement occurs, to which most of us would take exception.

" In reference to purulent ophthalmia in infants he (Dr. Legge Rowe, of Hull) states that if collosol argentum drops were employed impaired vision or blindness from this cause would cease and, *the drops being harmless to the conjunctiva, the treatment of the case may be safely left to the friends.*" Referring to Dr. Legge Rowe's original paper (B.M.J., 1915, Vol. I, 104), I find as follows. " In purulent ophthalmia of infants the same treatment is used, and I am certain that if this treatment was adopted in every case early, there would be no such thing as impaired vision or blindness from this cause. Many cases are treated in the out-patient department of the dispensary, and the drops being absolutely harmless may be safely trusted to the friends. The child is brought up once daily for the silver nitrate drops, and the eyes are washed out every hour at home, and the collosol drops put in."

This is a very different matter from leaving the treatment of the case in the hands of the friends.

It must be about ten years ago that I gave collosol argentum a trial in cases of ophthalmia neonatorum. It is true that I did not give it a very prolonged trial, for I came to the conclusion that, in my hands at any rate, the results were no better than those obtained with argyrol and protargol; I may be prejudiced, but such was my opinion at the time. I imagine that it has been tried at St. Margaret's Hospital in Kentish Town, and it would be interesting to hear the observations of the chief ophthalmic officer of that institution on this point.

I do not like to appear to be looking a gift horse in the mouth, but I think that the statement on the title page: "A plain statement of the facts relating to the action and uses of collosol argentum based entirely on the published reports of medical authorities in standard medical journals" seems to need revision.

I am, Sir, yours truly,

R. R. JAMES.

LONDON, *February*, 1922.

NOTES

Deaths

WE regret to record the death of Mr. Charles Wray, at the age of 63, in a London nursing home. An obituary will follow.

Dr. Lovell Moss died in hospital at Gibraltar on January 24, as the result of an accident between his car and a troop train at a level crossing. He studied at Moorfields and took the diploma of D.O. Oxford in 1920. He practised as an ophthalmologist in Gibraltar and Algeciras.

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Illuminating Engineering Society. Annual Dinner

SIR JOHN H. PARSONS, President of the Illuminating Engineering Society, presided at the highly successful Annual Dinner of the Society on February 10. A number of distinguished ophthalmic surgeons were present as guests, including Mr. J. B. Lawford (Chairman of the Council of British Ophthalmologists), Mr. J. Herbert Fisher (President of the Ophthalmological Society), Sir William T. Lister, and Mr. W. T. Holmes Spicer.

Sir Herbert Jackson (on behalf of the Royal Society) proposed the toast of the "Illuminating Engineering Society," recalling that its President had initiated a discussion on "Glare: Its Causes and Effect," very early in the history of the Society. Mr. Lawford, who followed, also alluded to the value of the Society's work in promoting the study of the effect of light on the eye. The President, in responding, gave an admirable survey of the Society's

activities during recent years, emphasising the importance of closer co-operation between ophthalmologists, physiologists, and illuminating engineers.

The toast of " The Guests," proposed by Mr. L. Gaster, was replied to by Mr. R. E. Graves (H.M. Chief Inspector of Factories), the Rt. Hon. William Brace (Mines Dept.), and Mr. H. E. Blain (Hon Secretary of the British Industrial " Safety First " Association). Mr. Graves paid a tribute to the influence of the Society in promoting a better appreciation of the benefits of good lighting in factories, Mr. Brace referred to the valuable work of the Society in connection with the lighting in mines, as a preventative of accidents, and with a view to diminishing the number of cases of Miners' nystagmus. Mr. Blain alluded to its efforts to improve Industrial Lighting in the interests of safety. The work of the Society was recognised to be of public utility and deserved to receive every encouragement in the future.

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The Annual Dinner of the Royal London Ophthalmic Hospital

THE Annual Dinner of the Past and Present Students of the Royal London Ophthalmic Hospital was held at the Langham Hotel on Thursday, February 9, and was well attended.

Dr. James Taylor (Consulting Physician to the Hospital) was in the chair, and after the Loyal Toast had been drunk, he proposed the health and prosperity of the Hospital and School. This was responded to by Mr. Theodore Luling, Chairman of the Hospital, and Mr. M. L. Hepburn, Dean of the School.

Sir Anthony Bowlby, Sir Robert Hill, and Sir Humphrey Rolleston replied to the toast of the guests, which was proposed by Mr. J. Herbert Fisher.

The health of the Chairman, which Mr. Treacher Collins proposed, was enthusiastically received.

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Royal College of Surgeons of England

THREE vacancies on the Council of the Royal College of Surgeons will be filled on July 6 next. Since the institution of a Conjoint Diploma—Ophthalmology and the F.R.C.S.—it is more than ever desirable that an ophthalmologist should sit upon the Council, and steps should be taken to provide the election of a suitable candidate.

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Erratum

A PARAGRAPH, published last month, stated that the County Council had appointed Captain O. E. Winberg to be Chairman of the newly-constituted Central Council for the Blind. The name Winberg should read Warburg.